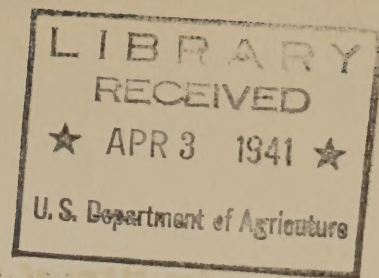


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TITRE OF ROSIN-FATTY ACID MIXTURES

By W. D. Pohle

The titre is the congealing point of the fatty acids separated from the fat and is one of the tests employed in evaluating the suitability of a fat for a given purpose. The titre of the fatty acids of a soap is often included in its specifications. Since the titre test is used in evaluating fats for the manufacture of soap, and since soaps are often evaluated by the titre of the fats they contain, information on the effect of rosin on the titre of fatty acids and the "equivalent" titre of rosin is frequently requested.

To procure this information, titre tests were made on three fatty acids, stearic, lauric, and oleic, and on mixtures containing three parts of one of these acids and one part of rosin acid, rosin or fatty acid. The materials were lauric, myristic, palmitic, stearic, and oleic acids, linseed oil-, palm oil-, and coconut oil- acids, rosins from longleaf and from slash pine gums, oxidized rosin, hydrogenated rosin, and pyroabietic acid. The figures obtained are given in the following table. The method of determining titre was that accepted as official. (Official and Tentative Methods of Analysis of the Assoc. of Official Agr. Chem., Fourth Ed., 1935.)

Titre of Fatty Acids, Mixed Fatty Acids, and Fatty Acid-Rosin Mixtures.

Material Constituting 1 Part of Mixture	Fatty Acids Constituting 3 Parts of Mixture		
	Stearic	Lauric	Oleic
Slash Rosin	51.2	30.8	-2
Longleaf Rosin.	51.4	31.0	-2
Oxidized Rosin.	52.8	32.1	-2
Crystalline Gum Acids	51.0	- -	- -
Rosin from Liquid Portion of Gum.	51.5	- -	- -
Pyroabietic Acid.	51.3	31.2	-2
Hydrogenated Rosin.	51.3	31.0	-2
Lauric Acid	48.3	35.7	5.2
Myristic Acid	48.8	29.7	15.0
Palmitic Acid	50.6	28.0	24.0
Stearic	55.2	29.3	30.5
Oleic Acid.	50.9	29.0	3.0
Linseed Oil Acids	51.4	29.1	14.0
Palm Oil Acids.	51.0	- -	22.8
Coconut Oil Acids	49.2	- -	- -

* Assistant Chemist, Naval Stores Research Division, Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture.

The titre of rosin cannot be determined, since there is no break in the time-temperature curve when rosin passes from the liquid to the solid or congealing state.

Moreover, from the data in Table I, it is evident that the calculation of an equivalent titre for rosin is impossible, since the change in titre of a given fatty acid by the addition of a second component is not a function of the titre of the second component.

The addition of rosin to a given fatty acid lowers its titre; also, the addition of other fatty acids to stearic acid and lauric acid lowers their titre. Measurement of the titre of oleic acid was difficult. It would appear that there might be a relation between the titre of the mixed fatty acids of which oleic acid is one component and the titre of the added component.

At present the application of the titre test to fatty acid-rosin mixtures appears to be limited to mixtures for which the relation between the titre test and the factory results have previously been determined. The correlation between titre tests and factory results may vary from plant to plant due to the use of different raw materials and manufacturing methods.

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March, 1940

SOAP